

Using Data and AI in medical education

Tim Shaw

**Professor of Digital Health
University of Sydney**

**Director of Research and Capacity Building
Digital Health CRC**



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digital health crc



Today

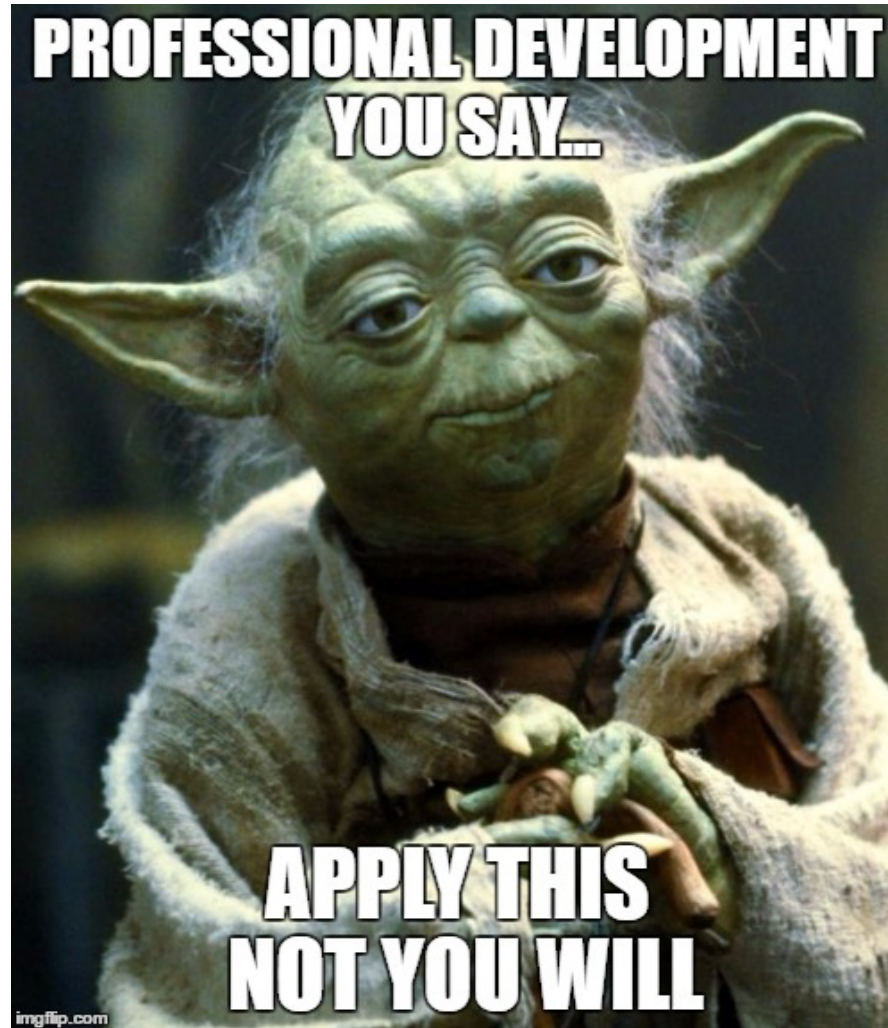
- What is the challenge?
- Practice analytics
- Impact of AI on Education and assessment
- Digital Health CRC

What is AI?



Its all about the data.....

Professional development as it stands not terribly effective



Online learning growing

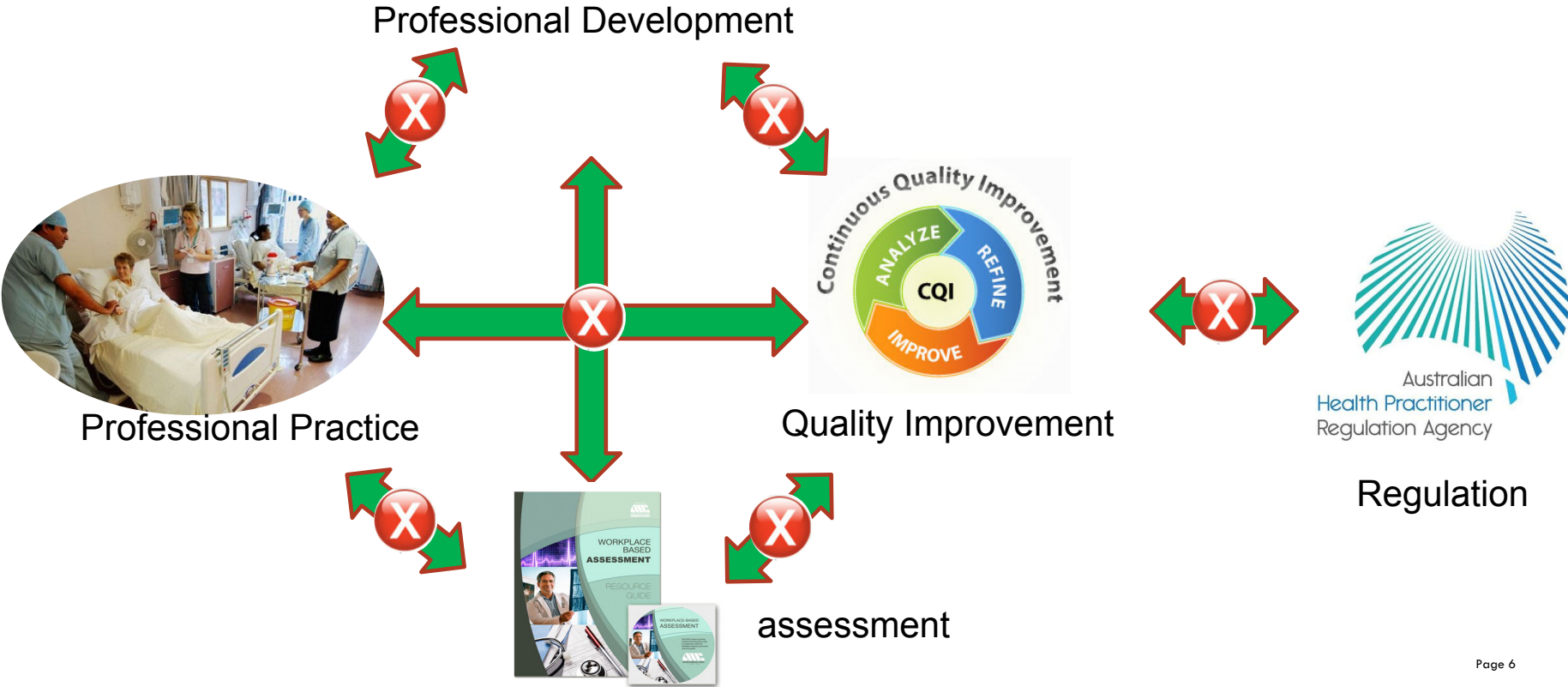
The collage features several elements: a screenshot of a Moodle course page for 'Online Orientation' on the NSW Department of Health website, a man with a shocked expression, a dog sleeping on a laptop, and a red question mark over a wooden block labeled 'EVIDENCE'.

The Moodle course page shows the following content:

- Home Page ▶ Home > Online Orientation
- Online Orientation
- Mandatory Training ▶
- Basic Life Support ▶ In its commitment to provide the best possible endeavours to provide them with up-to-date information
- Advanced Life Support ▶
- Child Protection File ▶
- Recognition of a Sick Child ▶
- Medication Administration ▶
- NSV
- Suic
- Cult
- Med
- Mini
- Gua
- Don Trai
- Dis
- Priv
- Inci

The course page also includes a search bar and a 'Go' button. The dog sleeping on the laptop is a brown and black Boxer. The man with the shocked expression is a young man with black hair, looking directly at the camera with his hands near his face.

Key challenges – education divorced from practice and QI?



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Practice Analytics

Using real time performance data and analytics to drive personalized education and performance improvement



How do clinicians feel about their data being used?

9 focus groups held with mixed teams

Major themes:

- Enthusiasm for feeding back clinical data
- Formative, not punitive, usage
- Desire for peer comparison, benchmarking and collaborative learning
- Data access and usage challenges
- Challenge with capturing complex clinical narratives



Shaw, T.J. et al, Health professionals' attitudes towards the feedback of routinely collected clinical data for performance feedback and personalised professional development. *MJA in press*

“....honestly, I think this (reviewing my performance data) is something I would drop everything to do. Otherwise how on earth would I know what I am doing is right?” (Oncology fellow)

“.....If there is a hint of a policeman in the room I will only do the minimum required.....” (Emergency resident)

Building a program of research

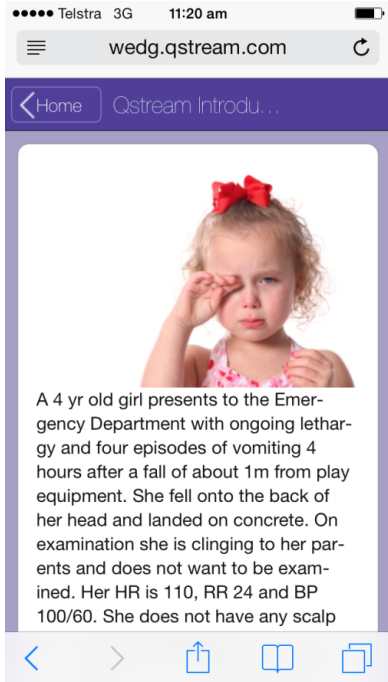
How do we couple clinicians performance data with their education?

How do we use micro-learning platforms to deliver timely co-face education?

What is the role of AI?



Case-based micro-learning – a new delivery technology



Choices

- Reassure her parents that it is normal for children to be a little sleepy when they are concussed and discharge her home with head injury advice as it has been more than 4 hours since the injury
- Increase frequency of neurological observations to 15 minutely and ask nursing staff to alert you if her GCS is less than 9
- Arrange immediate head CT scan
- Admit her to the observation area for 4 hrs with 30 min neurological observations

Submit

You	Key	Choices	%
	X	Reassure her parents that it is normal for children to be a little sleepy when they are concussed and discharge her home with head injury advice as it has been more than 4 hours since the injury	0%
	X	Increase frequency of neurological observations to 15 minutely and ask nursing staff to alert you if her GCS is less than 9	9%
	✓	Arrange immediate head CT scan	72%
	X	Admit her to the observation area for 4 hrs with 30 min neurological observations	18%

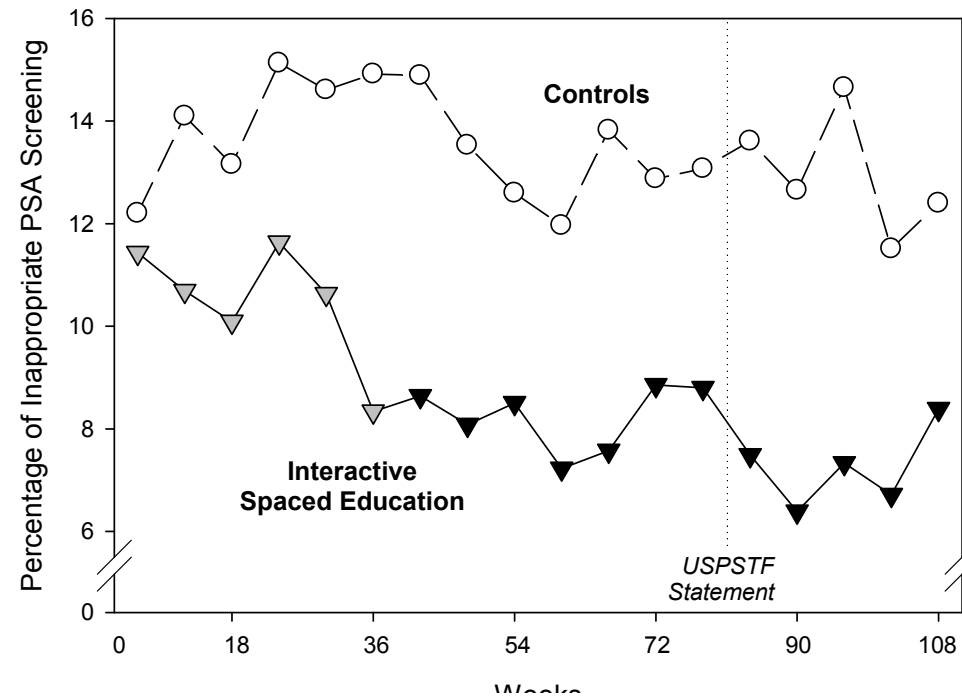
Sorry, your answer is incorrect!

Take home message

Consider performing a head CT in any child with a head injury with persistent vomiting or nausea, or worsening headaches.

Feedback

Head injuries in children are a common reason for presentation to an Emergency department, with the majority of these being relatively minor and not requiring imaging. Selecting which children represent the small but important cohort with a significant in-



Linking Cases to data - Turning point – Partners Healthcare

10 -12 cases sent to 600 nurses in enrolled hospital over a 3 month period.

1) Cases responding to trends in organisational adverse event data/QI programs

1-2 cases sent per week for 3 months

2) Cases responding to National Data such as NPSGs or National S & Q Health Service Standards

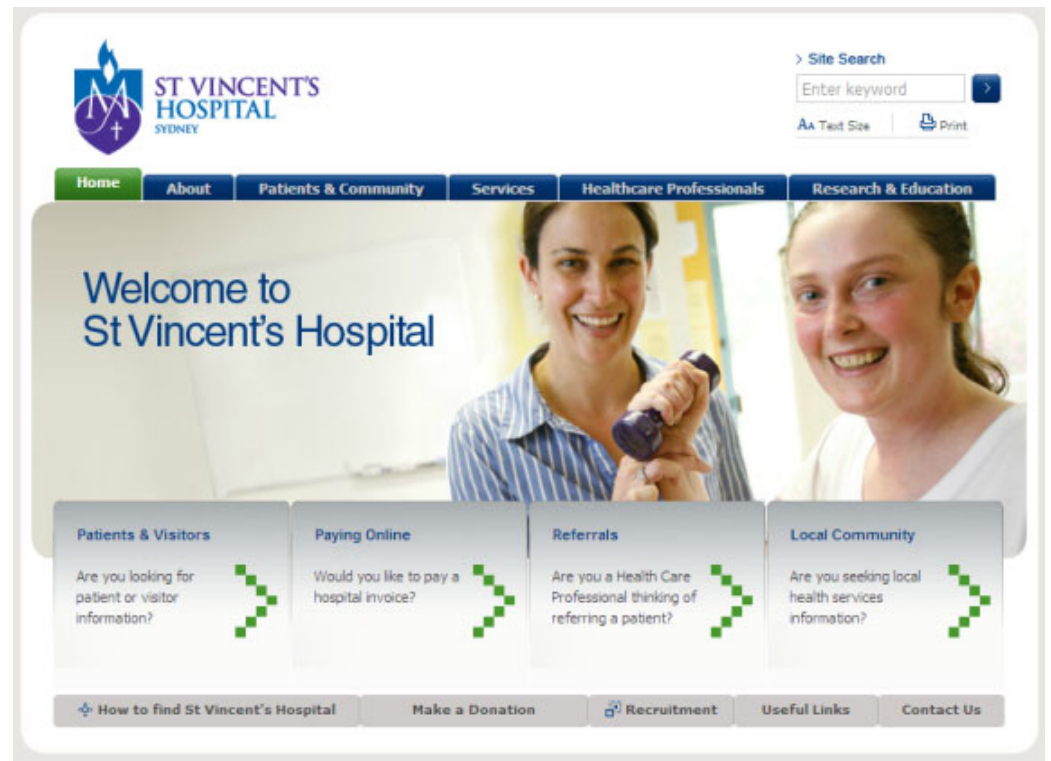
'Most talked about educational activity in memory of hospital leaders' Brigham and Women's Faulkner



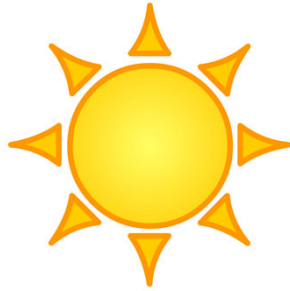
Self reported pain scores

Mixed method, quasi randomised study on self reported pain scores at Sacred heart hospital

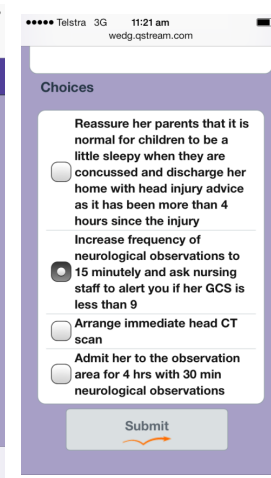
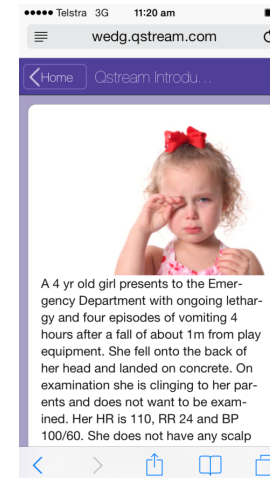
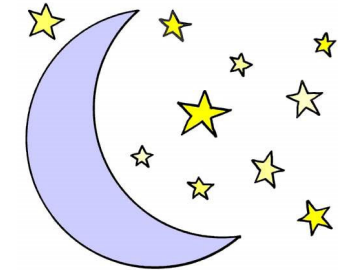
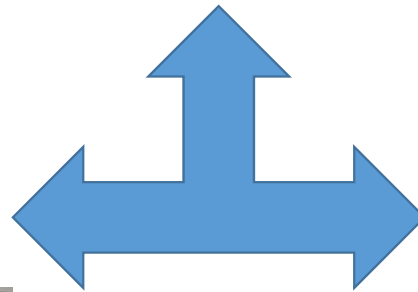
- Used Qstream and audit and feedback
- Improvement in pain management— 95% vs 22% for recording pain management.
- 1.8 point improvement in pain scores



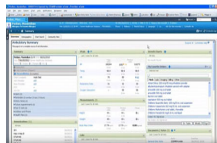
Moving down to the individual level Turning point 2



Problem	Wells & Measurements	Wells
Diabetic melita with complication	13.8	1.0
Diabetic melita without complication	13.8	1.0
Diabetes	13.8	1.0
Diabetic ketoacidosis	13.8	1.0
Diabetic neuropathy	13.8	1.0
Diabetic retinopathy	13.8	1.0
Diabetic nephropathy	13.8	1.0
Diabetic foot	13.8	1.0
Diabetic hypoglycemia	13.8	1.0
Diabetic hyperglycemia	13.8	1.0
Diabetic coma	13.8	1.0
Diabetic shock	13.8	1.0
Diabetic ketoacidosis	13.8	1.0
Diabetic hyperosmolar coma	13.8	1.0
Diabetic hypoglycemia	13.8	1.0
Diabetic hyperglycemia	13.8	1.0
Diabetic coma	13.8	1.0
Diabetic shock	13.8	1.0



Practice analytics – a vision?



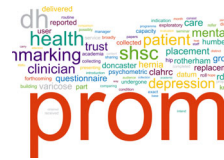
EMR



MBS/NPS etc



Registries



PROMs/PREMs



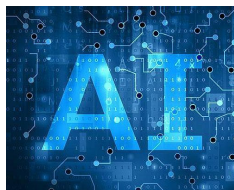
Claims data



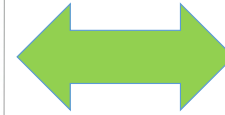
Assessment



Complaints/
regulatory data



Analyse and understand
practice and performance of
teams and individuals



Medical
Board of Australia

Personalised, information driven
High Impact Learning at coal face

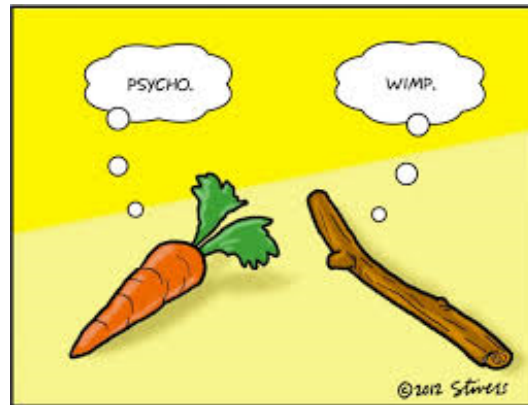
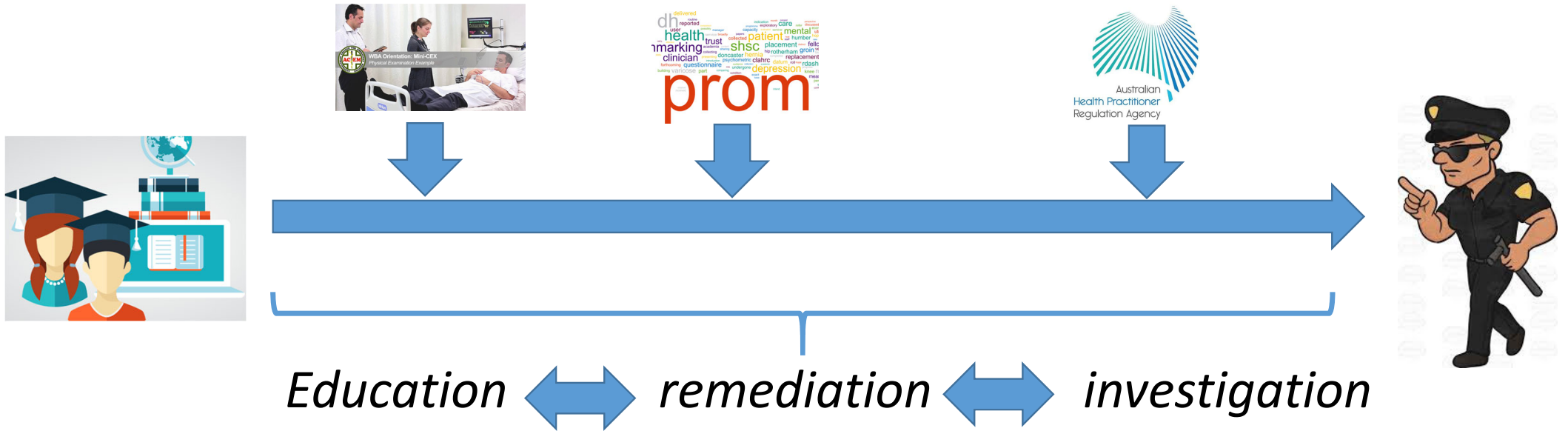
Professional Performance Framework

Some key challenges - Practice vaults



A key challenge

Performance improvement Vs Performance management

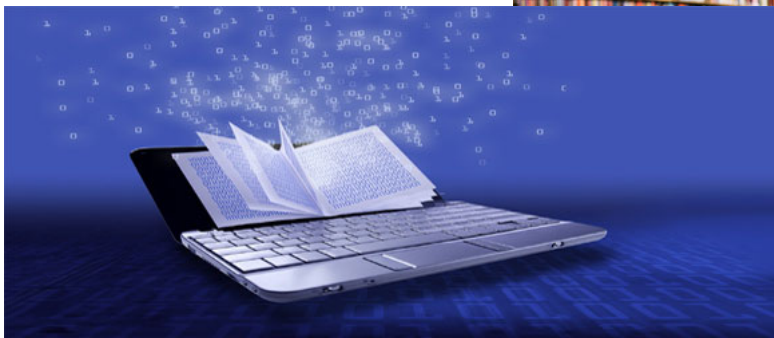


Where will AI have impact?

Automation of some processes

Grading Mini CEX and other assessment items

Access to new information in rapid time



Mini-Clinical Evaluation Exercise (CEX)

OPT08007 Clinical Skills 2

04/11/2002

Trainee's surname: Alan Trainee's first name: Johanne

Clinical skill assessed: Direct B3FO

Please grade (tick) the following areas using the ?rating scale:	Below expectation for level of training	Borderline for level of training	Meets expectations for level of training	Above expectations for level of training			U/C* Not Observed
	U (0%)	B (60%)	S (66-74%)	P (75-81%)	HP (82-89%)	GP (90-100%)	
History taking							
Examination Skills							
Communication Skills							
Clinical Judgment							
Professionalism							
Organisation/Efficiency							
Overall Competence							

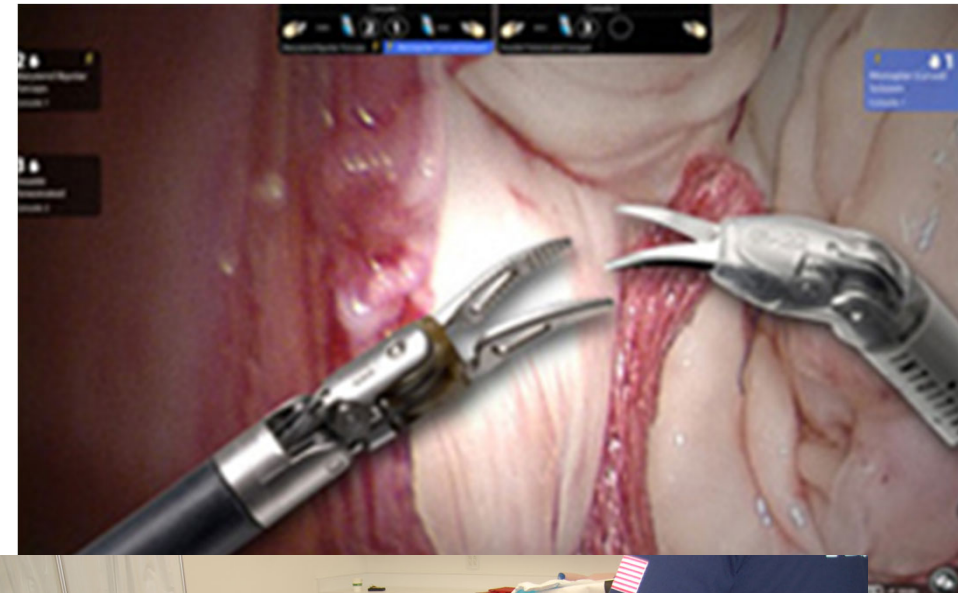
- U Unsatisfactory attempt at skill and/or potentially dangerous.
- B Borderline, marginal attempt at skill(s). Directive attention and re-training of skill required.
- S Satisfactory attempt at skill(s).
- P Demonstrates proficiency in skill.
- HP Demonstrates high level proficiency in skill.
- GP Graduate level proficiency in skill demonstrated.

<p>Anything especially good?</p> <p>good WB very good at taking history & keeping good notes. well practiced.</p>	<p>Suggestions for development:</p> <p>could make yourself more so get better view. more direct.</p> <p>Very optimistic aside for viewing with B3FO</p>
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Where will AI have impact?

Analysing performance for assessment feedback

- Eg Robotic Surgery
 - Google glasses
 - Alexa
-
- Pick individuals at risk early
 - Risk adjust performance



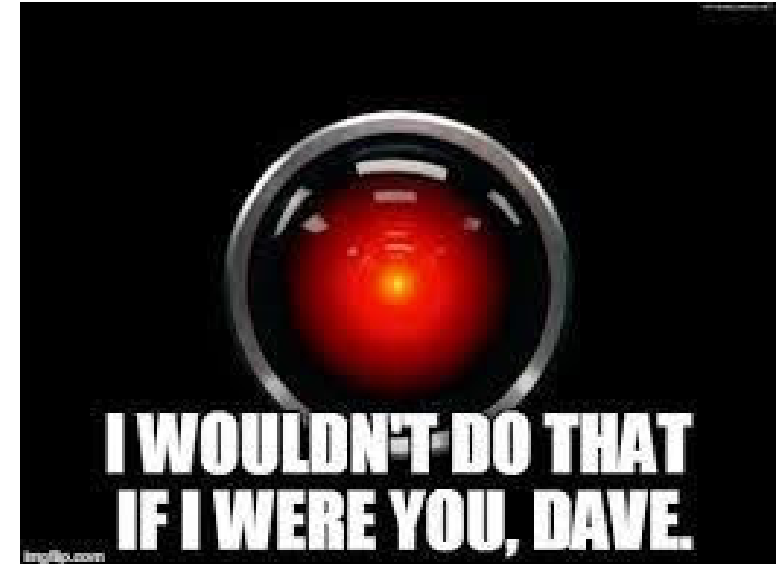
Where will AI have impact?

Intelligent Tutors?

Automating feedback against set rules



More intelligent feedback systems



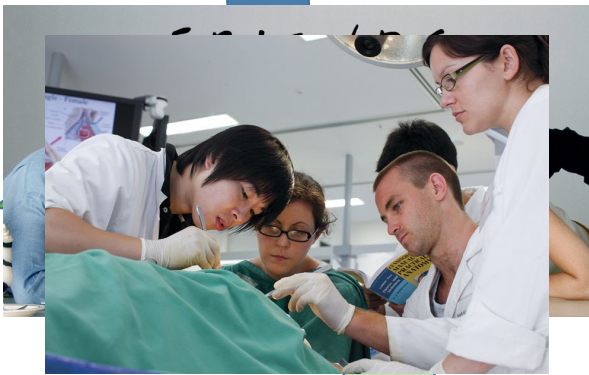
Where will AI have impact?

Constant companion along professional journey



NETFLIX

My CPD Home



Education Recommender System based on performance, practice and stage of career



**Galvanising our
Digital Health Sector**



digital health crc

Partners Span the Health and Wellness landscape



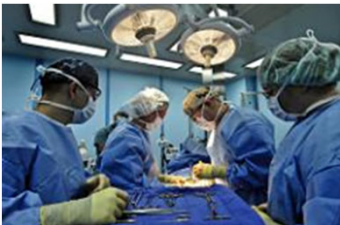

\$110M cash
\$120M in Kind

P&A Flagship Program in Understanding Clinical Practice

Develop tools to enable risk-adjusted performance benchmarking



Develop tools to support informed referrals for clinicians



Create data-driven systems linking practice with performance improvement for teams and individuals

Measure variation and benchmark performance

- How do we capture and collate data for performance analytics?
- How do we risk adjust for meaningful comparison?
- How do we assign responsibility of care to teams and individuals?
- How do we measure quality of practice?

Use transparency of data to optimise performance and choice

- How do we use performance and other data sets to improve referral choices for clinicians and consumers?
- How do we link practice data with professional development and performance improvement?
- How do we leverage performance data to support point-of-care decision making?
- How do we support organisations to use data to improve performance and efficiency?
- How do we optimise payment and claims management?



Build a platform for payers and providers to optimise claim management



Understand clinical variation and apply this knowledge to improve performance and move toward a learning health system





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EHEALTH CAPABILITY FRAMEWORK

Foundation Level for all Clinical Health Professionals

This document is an outcome of the 'eHealthMap', a multi-faculty collaborative project at the University of Sydney, funded via an Education Innovation Grant (2016) from the Office of the Deputy Vice Chancellor (Education). The project was led by Tim Shaw, Professor of eHealth, Faculty of Health Sciences, and managed by the Research in Implementation Science and eHealth group. Special acknowledgement goes to the project Steering Committee and key project informants, which includes stakeholders from the Faculties of Health, Medicine, Nursing, Dentistry, and Arts and Social Sciences, as well as stakeholders from local, state, and national health districts; government instrumentalities and eHealth organisations. The project has been developed in close association with the NSW Workforce Skills & Training Working Group chaired by Professor Annette Solman.

Join us....



Inaugural Practice Analytics Workshop

10 April 2019, 10-4pm

Assembly Room C - 1W24, West Lobby,

Partners HealthCare,|

Assembly Row,

399 Revolution Drive, Somerville, MA 02145

Aim: To scope how we harness growing interest in Practice Analytics – the use of performance data in professional development and practice improvement.

Learning Analytics 3.0

Bending the curve pre-conference workshop 25 Sept 2019



ICRE 2019

September 26-28, 2019, Ottawa, Canada



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Tim.shaw@Sydney.edu.au